

Networking puts school on crest of wave

by David A. Endres

Although computers are increasing in number within high schools and elementary schools across the country, the concept of linking computers together into a network to share data and programs is a relatively new idea.

Saratoga High School, on the rim of California's Silicon Valley south of San Francisco, is the first high school in that state to set up a computer laboratory with



Illustration by Bob Celander

a network (worth \$70,000) at a time when other schools are dispersing terminals throughout departments.

"We never anticipated much of what has happened," teacher Leo McKenna said. "Special education kids brought here are now learning word processing. Kids in Advanced Programming are writing programs for CAI applications. It feels great to be on the crest of a wave."

The lab concept, embraced by nearly everyone at the school, has even produced student peer pressure to discourage instances of intentionally "jamming" the computer system. Many of the 60 faculty members have requested more equipment for use throughout the campus and parents in the district are seeing the success of a system that they overwhelmingly approved three years ago.

The key components of the laboratory's computer network are the Omninet™ hardware that links the students' computers with the teacher's stations and Classroom Monitor™ software, allowing the teacher to control what transpires on the monitor's screen. The



school is both a beta test site for Classroom Monitor, which is made by Software Connections in nearby Santa Clara, and host to the first educational use of Omninet, manufactured by Corvus Systems, Inc., in San Jose, Ca.

The lab's teacher station allows communication with 30 students collectively or individually and the Classroom Monitor is capable of controlling and monitoring up to 64 microcomputers on the network. In addition, the teacher's workstation acts as a shared peripheral controller, providing the network with disksharing and printers sharing capabilities.

With this system, the teacher can set up a programming demonstration on one student's computer and allow other students to monitor that screen. The teacher can also monitor any individual student's display, download every student station or selective stations and allow students to share the use of peripherals.

The teacher station, using the Classroom Monitor, retains control over the entire system. In a typical CAI exercise, a program is sent to all student workstations and progress is monitored throughout the exercise. When the supervisor detects a student having problems, a help message can be sent immediately on a band at the top of the student's screen.

Saratoga High School uses a single floppy disk drive for the entire network. This drive is used to transfer programs to the Corvus hard disk and is accessible only by the teacher. "This effectively deals with unauthorized software copying and students fiddling around with the system programs," said school Vice-Principal Marion Kenworthy.

Throughout the lab are keyboards and display terminals for each student. The Classroom Monitor allows students to communicate over a one-line message band with each other as well as with the teacher. Files can be sent at any time to the printer which places them in a temporary buffer if it is busy.

By entering assigned codes, the teacher or supervisor can scrutinize any display terminal or automatically scan each display for five seconds. A keystroke freezes or restarts the scan.

About 90% of the schools' 1,540 students use the lab for different subjects and for varying exercises, primarily as a supplement to the present curriculum. Journalism students type articles on the terminals in order to save them on floppy disks for eventual print-out. Two programming classes cover computer literacy and advanced programming. Spanish, calculus, sociology and geometry classes intermittently share the facility. Students may spend lab hours doing homework or using programs to study for tests, including the S.A.T. for college entry.

The computer lab, an extensive and expensive undertaking, was carefully coordinated over many months by Saratoga administrators. Budget demands could have meant the demise of other school programs but that was avoided. In 1978, administrators organized a community task force to decide the program's direction. The task force formed a three-year purchasing plan and found that microcomputers with hard disk storage capacity were warranted.

That was the time of cut-backs following California's celebrated Proposition 13, and so a questionnaire, detailed with a budget breakdown, was sent to parents asking which programs should be cut or added. The questionnaire suggested reading instruction and computer instruction as examples of areas where improvements were needed.

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Most of the respondents who wanted to add programs specified "computers" at the cost of physical education, extra-curricular sports and industrial and fine arts. Despite these projections, the high school has not had to dismantle anything. All funds for the system came via a timely state sponsored School Improvement Plan (SIP) and the now defunct federal Secondary Education Act. SIP's provisions accommodate schools that show ideas for viable improvement. So far, the school has received all of its funds for the lab from these sources.

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Along with the SIP funds was money to pay three teachers to write educational programs. That job now fulfilled, the programs have been made available to school districts throughout the state.

Other teachers, apparently won over by the computer lab, are adamant in their requests for teacher-only, stand-alone terminals spread throughout departments. Two stations are now operating.

Saratoga High School's future computer goal is two-fold: to teach functional computer literacy as a basic skill through its computer courses and to develop in-house programs for its academic departments.

"The way to a teacher's heart and to avoid hostility to such a massive program," Kenworthy explained, "is not to ram it down their throats. We didn't force any teacher to participate and we deliberately fashioned the lab after a library media center, not a departmental phenomenon."

This type of reception is timely, however, because the SIP grant stipulates extending the computer application widely. Knowledgeable teachers and students are prompted to write new programs or purchase packaged software for the system. Four departments now have programs on the Corvus disk.

The school instituted volunteer workshops this past summer to train teachers to use advanced BASIC, word

processing, VisiCalc™ electronic spreadsheet and other applications.

Future projects include a "service bureau" to be maintained and updated by an advanced programming class. It will fulfill teacher academic needs by having students write new programs for credit plus, of course, the experience.

Kenworthy doesn't think the lab will expand further other than to place additional language boards or new software into the Apple II Plus™ computer.

"We don't intend to let this grow out of hand," she said.

Those students now writing programs per teacher request are actually modifying existing programs for the Apple. However, since the school is part of one of the nation's major electronics centers, there are some students who have become sophisticated by other means. A handful of students market the software they have created and one has been cited in a news article as a major software entrepreneur.

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Omninet Hardware and Classroom Monitor Software are both available from Electronic Concepts Pty Ltd

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